

Translated and Published by Japanese Standards Association

JIS R 6001: 1998

Bonded abrasive grain sizes

R 6001:1998

## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently JIS R 6001: 1987 is replaced with JIS R 6001: 1998.

The purposes of this revision are to make the standards on the macrogrit and the microgrit for general bonded abrasives conform to the corresponding International Standards.

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In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

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## Bonded abrasive grain sizes

Introduction This Japanese Industrial Standard has adopted the grain sizes of the macrogrit and the microgrit for general bonded abrasives, which have been specified in the first edition of ISO 8486-1, Bonded abrasives—Determination and designation of grain size distribution—Part 1: Macrogrits F4 to F220, and of ISO 8486-2, Bonded abrasives—Determination and designation of grain size distribution—Part 2: Microgrits F230 to F1200 published in 1996, without any modification of technical contents, and additionally has specified the grain size of fine powder for precision polishing which has not been specified in the corresponding International Standards.

In this Standard, the "portions" underlined with dots are the items which are not specified in the corresponding International Standards.

1 Scope This Japanese Industrial Standard specifies the grain sizes of abrasives for grinding wheel and for other general use, which are artificial abrasives as specified in JIS R 6111.

Remarks: The International Standards corresponding to this Standard are as follows.

ISO 8486-1: 1996 Bonded abrasives—Determination and designation of grain size distribution—Part 1: Macrogrits F4 to F220

ISO 8486-2: 1996 Bonded abrasives—Determination and designation of grain size distribution—Part 2: Microgrits F230 to F1200

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall be applied.

JIS R 6002 Testing method for bonded abrasive grain size JIS R 6111 Artificial abrasives

3 Classification of grain sizes Grain sizes are classified as shown in Table 1 to Table 3 in accordance with their ranges and grain size distribution.

Table 1 Class of macrogrit

Division								Clas	s of	grain	siz	e						
Macrogrit	F	4	F	5	F	6	F	7	F	8	F	10	F	12	F	14	F	16
	F	20	F	22	F	24	F	30	F	36	F	40	F	46	F	54	F	60
	F	70	F	80	F	90	F	100	F	120	F	150	F	180	F	220		

Remarks: Grain size is designated as "F OO".

Table 2 Class of microgrit for general abrasives

Division			Class of	grain size		
Microgrit	F 230	F 240	F 280	F 320	F 360	F 400
	F 500	F 600	F 800	F 1000	F 1200	

JIS R 6001:1998

2

R 6001:1998

Table 3 Class of microgrit for precision polishing

Division	Г					Cla	ass (	of grain	size					
Microgrit	#	240	#	280	#	320	#	360	#	400	#	500	#	600
	#	700	#	800	#	1000	#	1200	#	1500	#	2000	#	2500
1	#	3000	#	4000	#	6000	#	8000		•				

Remarks: Grain size is designated with the numerals followed with "No.".

4 Grain size distribution The grain size distribution shall follow Table 4 to Table 8.

The numbers expressing grain size distribution shown in each Table are those measured by the methods specified in JIS R 6002.

R 6001 : 1998

Table 4 Grain size distribution of macrogrits

F 4         mm         pm         9%         mm         pm         9%         mm         pm	Grain size	Test sieve through which 100 % of sample must pass (first stage)	hrough 6 of sample first stage)	Test sieve on whi quantity of samp and that quantity	Test sieve on which a definite quantity of sample may remain and that quantity (second stage)	finite remain id stage)	Test sieve on which a definite quan- tity or more of sample must remain and that quantity (third stage)	of sample montify (third)	finite quanust remain stage)	Two test sof sample (third stage	Two test sieves on which a de of sample in total must remai (third stage and fourth stage)	Two test sieves on which a definite quantity or more of sample in total must remain and that quantity (third stage and fourth stage)	luantity or hat quanti		Test sieve through which 3 % of the sample at the most may pass (fifth stage)	ugh which ple at the (fifth stage)
4         8         6         4         7         4         7         4         7         4         7         3.35		E E	шд	E E	md	%	mm	шп	%	mm		шп		%	mm	шп
5         6,70          4,75          20         4,00         3.35         2.80          70         2.80          9         4,00          4,75          4,00         1,00          4,00         1,00	•	8.00	1	5.60	ı	8	4.75	1	40	4.75	4.00	1		70	3.35	1
6         5.60         —         4.00         —         3.35         —         4.0         3.35         —         4.0         3.35         —         4.0         3.35         —         4.0         3.35         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         2.80         —         4.0         1.0         —         1.0		02.9	1	4.75	I	20	4.00	1	40	4.00	3.35	1		70	2.80	1
7         4.75          3.35          4.9         4.9         2.9          4.9         2.9          4.9         2.9          4.9         2.9          4.9         2.9          4.9         2.9          4.9         2.9         2.9         2.9         2.9         2.9         2.9         2.9         2.9         2.9         2.9         2.9         2.0         1.0 <td></td> <td>5.60</td> <td>1</td> <td>4.00</td> <td>١.</td> <td>20</td> <td>3.35</td> <td>1</td> <td>40</td> <td>3,35</td> <td>2.80</td> <td>1</td> <td></td> <td>70</td> <td>2.36</td> <td>ŀ</td>		5.60	1	4.00	١.	20	3.35	1	40	3,35	2.80	1		70	2.36	ŀ
8         4.00         —         2.60         —         4.00         —         4.00         —         4.00         —         4.00         —         4.00         —         4.00         —         4.00         —         4.00         —         4.00         1.00         —         4.00         <	1	4.75	1	3.35	1	20	2.80	1	9	2.80	2.36	l		70	2.00	l
10         3.35          2.36          4.5         2.00         1.70          4.5         2.00         1.70          4.5         1.70         1.40          4.5         1.70         1.40          4.5         1.70         1.40          4.5         1.70         1.40          4.5         1.70          4.5         1.70          4.5         1.70          7.0         1.10          4.5         1.70          7.0         1.70          1.70          1.70          1.70          1.70          1.70          1.70          1.70          1.70          1.70          1.70          1.70          4.5         1.70          4.0         1.70          4.5         1.70          4.0         1.70          4.5         1.70          4.0         1.70          4.0         1.70          4.0         1.70          4.0         1.70         1.70		4.00	1	2.80	ı	20	2.36	ı	45	2.36	2.00			70	1.70	I
12         2.80         —         2.00         —         4.5         1.70         1.40         1.40         1.40         1.40         1.40         1.40         1.80         —         1.90         1.90         —         4.5         1.40         1.13         —         4.5         1.40         1.13         1.00         —         1.00         1.00         1.00         —         4.5         1.40         1.13         1.00         —         4.5         1.40         1.13         1.00         —         4.00         1.10         —         4.00         1.10         —         1.00         —         1.00         —         1.00         —         1.00         —         1.00         —         1.00         —         4.00         1.10         —         4.00         1.10         —         4.00         1.10         —         4.00         1.10         —         4.00         1.10         —         4.00         1.00         —         4.00         1.00         —         4.00         1.00         —         4.00         1.00         —         4.00         1.00         —         4.00         1.00         —         4.00         1.00         1.00         1.00         —<		3,35	1	2.36	ļ	22	2.00	ı	45	2.00	1.70	1		70	1.40	[
14         2.36         —         1.40         —         45         1.40         1.8         1.9         —         70         1.9         —         45         1.40         1.10         —         45         1.18         1.00         —         70         1.0         —         80         1.10         —         80         1.10         —         80         1.10         —         80         1.00         —         80		2.80	1	2.00	ı	20	1.70	1	45	1.70	1.40	1		70	1.18	1
16         2,00         —         1,40         —         45         1,18         —         46         1,18         —         46         1,18         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         100         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         80         1,10         —         100         —         100         —         100         —         100         —         100         9 <td></td> <td>2.36</td> <td>   </td> <td>1.70</td> <td>ı</td> <td>82</td> <td>1.40</td> <td>1</td> <td>45</td> <td>1.40</td> <td>1.18</td> <td>I</td> <td></td> <td>20</td> <td>1.00</td> <td>1</td>		2.36		1.70	ı	82	1.40	1	45	1.40	1.18	I		20	1.00	1
20         1.70          1.18          20         1.00          45         1.00          850         710         70         70         70           22         1.40          1.00          850         1.00          850         710         70          9           24         1.18          1.00          100         25          100         45          800         100         65          9         9          9         9          9         9          100         45          100         65         9         9          9         9          9         9          9         9          9         9          9         9          9         9          9         9          9         9          9         9          9         9         9         9         9         9         9         9         9         9         9         9		2.00	1	1.40	1	22	1.18	1	45	1.18	1.00	1		70	ı	850
22         1,40         -         1,00         -         650         45         -         710         700         -         600         65         710         70         -         600         65         710         70         -         600         650         710         70         -         600         650         710         70         -         600         65         -         70		1.70	1	1.18	ı	20	1.00	1	45	1.00	ı	l	850	70	ŀ	710
24         1.18         —         —         950         25         —         710         45         —         710         650		1.40	ı	1.00	ı	70	ı	850	45	l		850	710	70	i	009
30         1,00           710         25          600         45          600         500         650		1.18	1	1	850	25	ı	710	45	1		710.	009	99	l	200
36          850          650         45          500         45          500         45          500         45          500         45          500         40          425         355         65          50          500          425         40          425         350         65          355         65          50	•	1.00		ı	710	25	1	009	45	l		009	200	65	l	425
40         —         710         —         500         30         —         40         —         40         —         425         35         40         —         45         355         300         65         —         355         300         65         —         355         300         65         —         355         300         65         —         365         —         365         90         —         365         40         —         360         250         250         250         40         —         360         250 <td></td> <td>1</td> <td>850</td> <td>1</td> <td>009</td> <td>25</td> <td>ı</td> <td>200</td> <td>45</td> <td>ı</td> <td></td> <td>200</td> <td>425</td> <td>92</td> <td>l</td> <td>355</td>		1	850	1	009	25	ı	200	45	ı		200	425	92	l	355
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60         —         425         —         300         30         —         250         40         —         250         212         40         —         250         212         40         —         212         40         —         212         180         65         —         180         65         —         180         65         —         180         60         —         180         180         65         —         180         65         —         180         40         —         180         180         65         —         180         180         40         —         180         180         65         —         180         40         —         180         180         65         —         180         180         40         —         180         180         40         —         180         65         —         180         —         180         40         —         180         65         —         180         —         180         40         —         180         40         —         180         40         —         180         40         —         180         40         —         180         180	•	1	200	ı	355	30	ı	300	40	-		300	250	65	1	212
70          355          212         40          212         180         65          180           80          300          180         40          180         150         65          1           90          180         20          150         40          150         65          1           100          180         20          150         40          150         65          1           120          180         20          106         40          106         90         65          1           150          150          150         40          106         90         65          1           150          150          150         40          106         90         65          1           180          150          150         40          1         1			425	ı	300	30	1	250	40	1		250	212	. 65	ı	180
80         —         300         —         212         25         —         180         40         —         180         —         180         —         180         —         150         40         —         150         125         65         —         1           100         —         180         —         125         40         —         125         106         65         —         1           120         —         180         —         125         40         —         106         90         65         —         1           150         —         160         15         —         15         40         —         16         90         65         —         1           180         —         150         15         —         15         40         —         15         65         —         1           180         —         125         15         —         15         40         —         15         65         —         1           180         —         125         12         12         12         12         12         12         1         1         1		1	355	1	250	25	1	212	40	-		212	180	65	ì	150
90         —         250         —         180         20         —         150         40         —         150         125         65         —         1           100         —         121         —         125         40         —         125         106         65         —         1           120         —         180         —         125         40         —         106         90         65         —         1           150         —         106         15         —         75         40         —         75         63         65         —         1           180         —         125         90         15         —         75         40         —         75         63         65         —         1           180         —         125         9         15         —         63         40         —         63         65         —         1           180         —         125         15         —         53         45         65         —         1         1		i	300	Ι	212	25	1	180	40	1		180	150	65	i	125
100         —         212         —         150         —         125         40         —         125         106         65         —           120         —         180         —         125         20         —         106         40         —         106         90         65         —           150         —         150         —         15         40         —         75         63         65         —         7           180         —         125         —         90         15         —         63         40         —         63         53         65         —           20         —         126         —         125         —         53         45         60         —         9		ı	250	ı	180	20	1	150	40	eren		150	125	65	1	106
120         —         180         —         125         20         —         106         40         —         106         90         65         —           150         —         106         15         —         75         40         —         75         63         65         —           180         —         106         15         —         63         40         —         63         53         65         —           220         —         106         —         75         15         —         53         40         —         53         45         60         —		1	212	1	150	20	i	125	40	1		125	901	65	١	75
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180         —         125         —         90         15         —         63         40         —         63         53         65         —           220         —         106         —         75         15         —         53         40         —         53         45         60         —         6		ı	150	ı	106	15	1	75	40	1		75	83	65		45
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		1	106	1	75	15	1	53	\$	١		53	45	99	ļ	1

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R 6001:1998

Table 5 Grain size distribution of microgrits for general abrasive (photosedimentation method)

Unit: µm

Grain size	Particle diameter at 3 % point of cumulative height (d 3 value)	Particle diameter at 50 % point of cumulative height (de - 50 value)	Particle diameter at 94 % point of cumulative height (d, -94 value)
F 230	82 max.	53.0±3.0	34 min.
F 240	70. max.	44.5±2.0	28 min.
F 280	59 max.	36.5±1.5	22 min.
F 320	49. max.	29.2±1.5	16.5 min.
F 360	40 max.	22.8±1.5	12 min.
F 400	32. max.	17.3±1.0	8 min.
F 500	25 max.	12.8±1.0	5 min.
F 600	19 max.	9.3±1.0	3 min.
F 800	14 max.	6.5±1.0	2 min.
F 1000	10 max.	4.5±0.8	l min.
F 1200	7 max.	3.0±0.5	1 min.(1)

Note (1) This is particle diameter at 80 % point of cumulative height ( $d_s - 80$  value).

Table 6 Grain size distribution of microgrits for general abrasive (Sedimentation method)

Unit: µm

Grain size	Particle diameter at 3 % point of cumulative height (d <sub>s</sub> - 3 value)	Particle diameter at 50 % point of cumulative height (d <sub>s</sub> - 50 value)	Particle diameter at 95 % point of cumulative height (d <sub>z</sub> - 95 value)
F 230	77 max.	55.7±3.0	38 min.
F 240	68 max.	47.5±2.0	32 min.
F 280	60 max.	39.9±1.5	25 min.
F 320	52 max.	32.8±1.5	19 min.
F 360	46 max.	. 26.7±1.5	14 min.
F 400	39 max.	21.4±1.0	10 min.
F 500	34 max.	17.1±1.0	7 min.
F 600	30 max.	13.7±1.0	4.6 min.
F 800	28 max.	11.0±1.0	3.5 min.
F 1000	23 max.	9.1±0.8	2.4 min.
F 1200	20 max.	7.6±0.5	2.4 min.(1)

Note (1) This is particle diameter at 80 % point of cumulative height ( $d_s - 80$  value).

R 6001:1998

Table 7 Grain size distribution of microgrits for precision polishing (Sedimentation method)

Unit: µm

Gr	ain size	Particle d of the lar (d. – 0			neter at 3 % ulative height 3 value)	point of cur	meter at 50 % nulative beight 50 value)	Particle diam point of cumu (d <sub>4</sub> - 94	lative height
#	240	127	max.	90	max.	60.	0±4.0	48	min.
#	280	112	max.	79	max.	52.	0±3.0	41	min.
#	320	98	max.	71	max.	46.	0±2.5	35	min.
#	360	86	max.	64	max.	40.	0±2.0	. 30	min.
#	400	75	max.	56	max.	34.	0±2.0	25	min.
#	500	65	max.	48	max.	28.	$0 \pm 2.0$	20	min.
#	600	57	max.	43	max.	24.	0±1.5	17	min.
#	700	50	max.	39	max.	21.	0±1.3	14	min.
#	800	46	max.	35	max.	18.	0±1.0	12	min.
#	1000	42	max.	32	max.	15.	5±1.0	9.5	min.
#	1200	39	max.	28	max.	13.	0±1.0	7.8	min.
#	1500	. 36	max.	24	max.	10.	5±1.0	6.0	min.
#	2000	33	max.	21	max.	8.	5±0.7	4.7	min.
#	2500	30	max.	18	max.	7.	0±0.7	3.6	min.
#	3000	28	max.	16	max.	5.	7±0.5	2.8	min.

Table 8 Grain size distribution of microgrits for precision polishing (Electrical resistance test method)

Unit: µm

Gra	in size	Particle di of the larg (d <sub>o</sub> – 0	est grain		meter at 3 % sulative height 3 value)	Particle diameter at 50 % point of cumulative height (d <sub>e</sub> - 50 value)	point of cum	meter at 94 % Julative height 4 value)
#	240	127	max.	103	max.	57.0±3.0	40	min.
#	280	112	max.	87	max.	48.0±3.0	33	min.
#	320	98	max.	74	max.	40.0±2.5	27	min.
#	360	86	max.	66	max.	35.0±2.0	23	min.
#	400	75	max.	58	max.	30.0±2.0	20	min.
#	500	63	max.	50	max.	25.0±2.0	16	min.
#	600	53	max.	43	max.	20.0±1.5	13	min.
#	700	45	max.	37	max.	17.0±1.3	11	min.
#	800	38	max.	31	max.	14.0±1.0	9.0	min.
#	1000	32	max.	27	max.	11.5±1.0	7.0	min.
#	1200	27	max.	23	max.	9.5±0.8	5.5	min.
#	1500	. 23	max.	20	max.	8.0±0.6	4.5	min.
#	2000	19	max.	17	max.	6.7±0.6	4.0	min.
#	2500	16	max.	14	max.	5.5±0.5	3.0	min.
#	3000	13	max.	11	max.	4.0±0.5	2.0	min.
#	4000	- 11	max.	8.	0 max.	3.0±0.4	1.3	min.
#	6000	8.0	max.	5.	0 max.	2.0±0.4	0.8	min.
#	8000	6.0	max.	3.	5 max.	1.2±0.3	0.6	min.(2)

Note (2) This is particle diameter at 75 % point of cumulative height  $(d_v - 75 \text{ value})$ .

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## Graph based on JIS R6001

